

Conservation and Management of Wetlands in Pandihing Bird Sanctuary of Sibsagar District, Assam

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Received 2 March 2013; Revised 16 July 2013; Accepted 8 October; Published 2 January 2014

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Abstract

Wetlands are the most common and integral feature of the fluvial landscape of Assam. The wetlands are locally known as "Beel", "Jolah", "Pitoni" etc. The beels in Assam are water bodies of different size and shapes, generally connected to the rivers the Brahmaputra, Barak and their tributaries. Panidihing Bird Sanctuary of Sibsagar district is very rich in wetland ecosystem. The wetlands play a vital role in the creation of good ecosystem balance and in maintaining healthy environmental condition of the area. In spite of their well recognized importance, the wetlands of Panidihing area presently suffer from degeneration and ecodegradation. These wetlands at present, however constitute a fast disappearing habitat in the Panidihing area. In this paper, an attempt is made to highlight the severity of the wetlands as sanctuary and provides a framework for the better management of the sanctuary.

Keywords

Wetland; Panidihing Bird Sanctuary; Ecosystem

Introduction

Wetland is a complex natural system. Wetlands are areas which are submerged under water or water saturated land permanently or for part of the year. As per definition given at Ramsar convention (Scott, 1989) "Wetlands are areas of marsh, fern, peatland or water, whether natural or artificial, permanent or temporary with water that is static or flowing, fresh, brackish or salt including areas of marine water, the depth of which at low tide does not exceed meters". In Assam, majority of the wetlands are formed mainly due to fluvial action of the rivers. Using satellite remote sensing technique, 3515 wetlands has been identified

in Assam. Wetlands harbour a wide variety of flora and fauna, all of great economic, aesthetic and scientific importance. All the wetlands, besides being the economic resource base and rich in bio-diversity, help in reducing flood height and thus flood damage. Panidihing area of Sibsagar district is very rich in wetland ecosystem. Because of the unique ecological habitat base for a variety of flora and fauna, Panidihing area has assumed the status of a sanctuary in 1996. A number of wetlands, swamps and various types of trees; grasses, etc. altogether form an important site of rich diversity. The wetlands which play vital role in maintaining the healthy environmental condition of the area, yet have not been given the importance they deserve in recent years. Large scale encroachment, growth of human activities, overuse of the economic resources including extensive fishing and above all the mismanagement of the wetlands have all contributed to the destruction of the wetlands of the area. It is, therefore, an imperative need to conserve the wetlands, especially for enriching the geo-environmental quality of the region.

Objectives

- To analyse the geo-environmental conditions of the existing wetlands of Panidihing area.
- To assess the potentiality of the wetlands and to evaluate strategies for conservation and management.

Methodology

The required information was collected from both

primary and secondary data sources. The necessary primary data were collected from field visit and field survey while the secondary data were collected from respective government offices and agencies. Maps, graphs and diagrams were also prepared by using statistical techniques on the processed data. The scope of the study is poor means of communication to the field of study. It is very difficult to collect all the required information within a very short span of time. The observations made in the study are primarily based on the three months study. However, a period of three months is not sufficient to assess the geo-environmental status of the wetlands of the study area. The study area as a whole is least studied and therefore published works on it are too scarce. The scope of the study has been limited due to the non-availability of data and required maps of adequate scale. The transport and communication facilities to the field of study are very poor due to the negligence of the government. But remote sensing images played a significant role in the present study and Landsat ETM image and IRS images (1973, 2010) were used to map the wetlands through visual interpretation. In the present research work, an attempt has been made to investigate and analyze the wetlands of Panidihing area in a systematic, organized and rational way.



FIG. 1 LOCATION MAP OF THE STUDY AREA

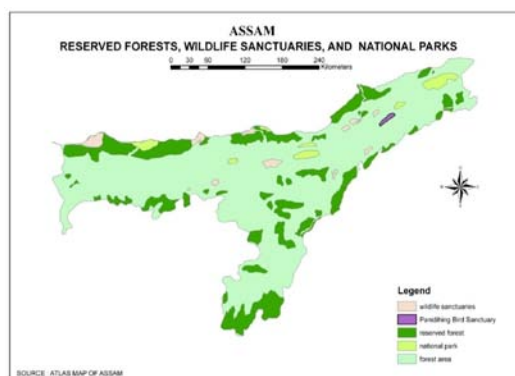


FIG. 2 LOCATION OF PANIDIHING BIRD SANCTUARY IN ASSAM.

Study Area

The study area is confined to Panidihing Bird Sanctuary of Sibsagar district, Assam which is very rich in wetland ecosystem. Sibsagar is a very popular and important district of Assam which is divided into three sub-division–Sibsagar (HQ), Nazira and Charaideo and Panidihing bird sanctuary is in the Sibsagar sub-division. Sibsagar district covers an area of 2668 sq km, out of which this moderately sized bird sanctuary occupies an area of 33.93 sq km (Fig-1 and Table-1). This sanctuary was established in the year 1996 by the Government of Assam (Fig-2 and Table-2 and Table-3). Strategically sited in Assam's Sibsagar district noted for its plentitudes of oil mines, Panidihing Bird Sanctuary provides much needed freshness to a raucous urban town. Set in a stunning backdrop, it houses several species of residential as well as migratory birds. It is a paradise of birds with about 165 species of birds recorded. Panidihing area is a home of various endangered and rare species of flora and fauna.

TABLE 1 SIBSAGAR DISTRICT (ASSAM), GENERAL INFORMATION

Sub division	Sibsagar, Nazira, Charaideo
Area (sq km)	2668
Population	10,52,802
Density	395 (per sq. km)
Literacy rate	75.33%
Boundaries	East- Dibrugarh, West- Jorhat ,North- river Brahmaputra, South- Nagaland and Arunachal

Source: GBD'S Assam Year Book

TABLE 2 DISTRICT –WISE NUMBER OF WETLANDS IN ASSAM

Districts	No. of wetlands
Barpeta	97
Bongaigaon	100
Cachar	340
Darrang	103
Dhemaji	139
Dhuburi	233
Dibrugarh	86
Goalpara	165
Golaghat	330
Hailakandi	47
Jorhat	109
Kamrup	352
Karbi-anglong	77
Kokrajhar	85
Lakhimpur	151
Morigaon	183
Nagaon	379
N.C.hills	10
Nalbari	68
Sibsagar	109
Sonitpur	206
Tinsukia	74

Source: Boruah. P. *et al* (1997), Wetlands of Assam .Assam Remote Sensing Application Centre, Guwahati and Space Application Centre, Ahmadabad.

TABLE 3 PANIDIHING BIRD SANCTUARY, GENERAL INFORMATION.

Established in	December 1996
Area	33.93 sq. km
Location	Sibsagar district, Assam
Main attraction	165 species of birds
Climate	sub-tropical
Soil	Alluvial
Vegetation	Evergreen/semi evergreen
Ideal time for visit	October to February

Physical Description of Panidihing Wetlands

A large number of perennial water bodies in the form of beels are observed in the sanctuary. The wetlands are distributed unevenly throughout the sanctuary having variable sizes and shapes. The smallest of them occupies an area of about 1 ha while the largest one has an area of more than 15 km during winter season. The shape of the wetlands also varies. Various factors are responsible for the determination of shape of the wetlands. Among the various factors including geology, location, stage of development etc. plays an important role. The shape of the wetlands is mainly of five types – linear, irregular, and discreet and ox bow shape.

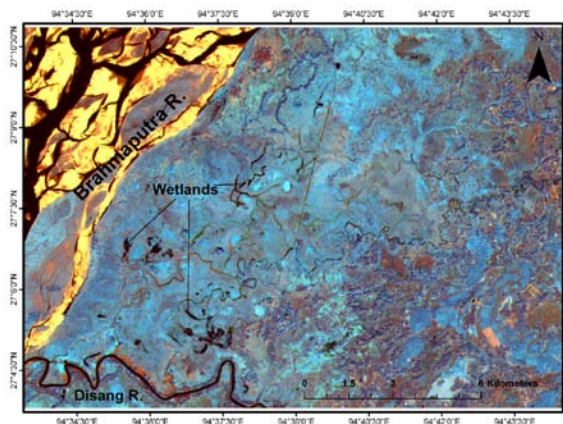


FIG. 3 LANDSAT ETM IMAGE (RGB – 6, 7, 4) SHOWING THE WETLANDS OF THE STUDY AREA.

TABLE 4 MAJOR WETLANDS OF PANIDIHING AREA

Garjan beel	Takia beel
Jorjoria beel	Gelademow
Ujantali beel	Kandulijan beel
Kotaioni beel	Sagunpara beel
Kandulijan beel	Jorjoria beel
Fulai beel	Moridesang beel
Dighali beel	Gaiguma beel
Lolitangkur beel	

Source: Field survey.

Beels in Panidihing area are geomorphologically very interesting features. The genesis and the growth of the

wetlands are directly associated with the hydrologic and fluvio-geomorphic behavior of the regions, geophysical conditions and tectonic evolution of the region and the pattern of land use and human occupancy in the nearby areas. Some of the wetlands keep the contact with the parent river system while others have lost it and have become isolated.

Landuse Pattern in the Beel Area

Depending upon the quality and geographical characteristics of land, the pattern of landuse in the beel area is categorized into different classes:

- Agricultural.
- Residential.
- Commercial.
- Open space/uncultivated land
- Forest area.

Among these agriculture is the most dominant. The lands around beels are normally used for agriculture. However, during summer, agricultural activities are disrupted as flood and the areas are covered by vast water bodies. Fishing is then widely practised by the local people. Many of the nearby areas of the beels are reclaimed and developed as residential as well as commercial areas. Sarguwa , Samaria villages etc are some examples of residential areas. Towards east, most of the areas are covered by forests. About 60 sq km area towards north are covered by forest which is named as Panidihing Reserved Forest. Some areas are left as open space areas which are not used for any activity due to some unfavourable conditions.

TABLE 5 VILLAGES COVERED IN THE SURVEY

Sl. No	Name of the villages	Population Structure
1	Sarguwa	Kalita, Ahom, Kaibartas, Muttack
2.	Sumarian	Ahom, Muttack, Chutiya
3.	Boloma	Mishing, Deori
4.	Alichinga	Ahom, Mishing
5.	Milanpur	Mishing, Kachari

Source: Data collected from the sample survey

TABLE 6 COMMON AQUATIC PLANTS

Local names	Scientific name
Kolmou	Ipomea aquatic
Meteka	Elichhomia spp.
Borpuni	Pistia straiotes
Kachu	Colocasia esculenta
Podum	Nelumbo nucifera
Bhet	Nymphaeatotus
Helochi	Engydra fluctuans
Shingori	Trya natators

Source: field study.

TABLE 7 COMMON FISH TYPES

Local names	Scientific name
Chenga	Channa stewarti
Bor chenga	Channa amphibious
Chengali	Channa orientallis
Pabho	Ompok bimaculatus
Seniputhi	Puntius sorrow
Kandholu	Notopterus

Bio-diversity Value

Wetlands of the area are very rich in floristic and faunal diversity. Some plants found in the water of these beels not only add the beauty to the wetlands but also have their economic importance. The wetlands provide breeding and feeding ground for million of birds. Panidihing area is a paradise for birds with about 165 species of birds recorded of which 69 species are migratory and 96 species are residential. The birds of the area belong to 40 various families of birds. Among the major faunal population are different species of fish, water snacks, frogs, mussels, butterflies, etc.

TABLE 8 CHECKLIST OF BIRDS FOUND IN THE PANIDIHING BIRD SANCTUARY

Sl no	Family	
1	Pondicipedidae	Greebs
2	Pelecanidae	Pelicans
3	Phalacrocoracidae	Cormorants
4	Anhingidae	Darter
5	Ardeidae	Egrets, herons, bitterns
6	Ciconiidae	Storks
7	Threskiornithidae	Ibis & Spoonbills
8	Anatidae	Ducks & Geese
9	Accipitridae	Eagles and Vultures
10	Falconidae	Falcons
11	Phasianidae	Pheasants, Partridges
12	Gruidae	Cranes
13	Recurvirostridae	Storks & avocets
14	Gallinidae	Pratincoles
15	Charadriidae	Plovers
16	Scolopacidae	Sandpipers
17	Laridae	Gulls, terns
18	Columbidae	Pigeon, Doves
19	Psittacidae	Parrots
20	Cuculidae	Cuckoos
21	Strigidae	Owls
22	Apodidae	Swifts
23	Alcedinidae	Kingfishers
24	Micropodidae	Bee eaters
25	Columbidae	Roller
26	Upupidae	Hoopoes
27	Caprimulgidae	Grasshoppers
28	Alaudidae	Larks
29	Hirundinidae	Swallows, martins
30	Laniidae	Shrikes
31	Oriolidae	Drongos
32	Sturnidae	Mynas

33	Corvidae	Crows, magpies
34	Pycnonotidae	Bulbul
35	Paridae	Tits
36	Muscicapidae	
37	Motacillidae	Pipits & wagtails
38	Nectarinidae	Sunbirds
39	Zosteropidae	White eyes
40	Ploceidae	Woven birds, sparrow

Source: Divisional Forest Office, Sibsagar

Problems and Prospects of Panidihing Bird Sanctuary

It has been observed that the wetland environment in the Panidihing Bird Sanctuary deteriorates day by day due to human activities and carelessness of the government. Though the area has substantially rich wetland resources which exhibit a significant ecological diversity, the wetlands face a serious threat to their survival due to increasing human interferences. Major problems and threats of the wetlands have been identified as follows:

- Large scale encroachment within the Panidihing area. Due to rapid growth of population, there has been an increasing pressure of man on the wetland areas.
- Hunting, trapping and killing of wild birds and mammals and the adjoining areas of Panidihing bird sanctuary.
- Wetlands are store houses of fishes. Although due to unplanned fishing practices, the fish population decreases day by day. Panidihing though declared as bird sanctuary, illegal fishing is still practiced by the nearby villagers.
- Conversion areas for agricultural and human settlement. Agriculture is one of the most important occupations of the area residents. The farmers in this area are mostly illiterate as far as knowledge regarding the consequences of agrochemicals is concerned. Along with the harm caused by the farmers and the consumers, the wetlands are affected nearby areas adversely.
- The wetlands also receive some amounts of waste water from the adjoining areas. The hume pipe industry and brick industry in the nearby areas also cause pollution to some extent.
- Though the area is regarded as a sanctuary, there is a lack of publicity of the region. The transport and communication network is very

poor to Panidihing.

- Besides the human impact, wetlands face the problem of siltation by annual flood of the Brahmaputra.

Though Panidihing Bird sanctuary suffers from various problems, it offers tremendous prospects for tourism as well. Endowed with a rich avifauna and spectacular scenery, Panidihing tourism still remains unexplored. It is found that the government initiative in tourism sector is far below expectation in the context of modern day tourism. By well-planned publicity, trained manpower, improved service quality, informative publicity, literature, tourism can be geared up in the area.

Conservation of Wetlands

Some conservation measures are-

- State government must formulate and adopt a wetland policy and ensure its proper implementation. Such a move would have a great effort on future environment security, as well act as a lifeline to numerous people whose lives depend on wetlands.
- Protection of boundary of wetland, demarcation of boundary by fixing pillars and preventing encroachment.
- Realizing the gravity of the encroachment problem in the beel areas and stricter legislation to ensure prevention of the fast growing human encroachment and pollution should be enacted. All types of illegal encroachment should be vacated from the beel areas.
- Control of commercial fishing.
- Control of exploitation of aquatic products.
- Extensive survey and quantification of flora and identification of threatened species.
- All neighboring residents of the area should make aware of the fact that like open spaces, wetlands also play a vital role in maintaining a healthy environment.

Findings

A number of wetlands are unevenly distributed throughout the bird sanctuary and some of the beels remain dry during the winter season.

From the study, it has been observed that wetlands of Panidihing are very rich in bio-diversity. Most of the

beels are infested with floating vegetation. Different types of vegetation growth indicate the bio-diversity richness of the wetlands as the vegetation supports many varieties of birds, animals, insects and micro-organisms etc.

Wetlands in the study area are degraded in recent years partly due to natural processes and human activities. Problems of siltation by annual flood, hunting of residential and migratory birds, unscientific fishing, encroachment in the marginal lands of wetlands, over exploitation of aquatic products, felling of tree in the nearby areas etc. are some of the factors responsible for degradation of wetlands in the study area. In 1973, the area of the studied wetland was 3.091 sqkm and the number was 53 but from the 2010 it has been found that the number (40) as well as the area (1.164 sqkm) of the wetland decreased (Fig. 4 and 5).

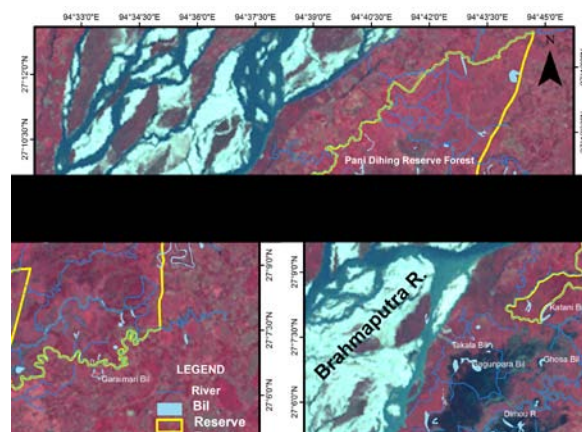


FIG. 4 IRS IMAGE OF 1973 (RGB – 3, 2, 1) SHOWING THE WETLANDS OF THE STUDY AREA.

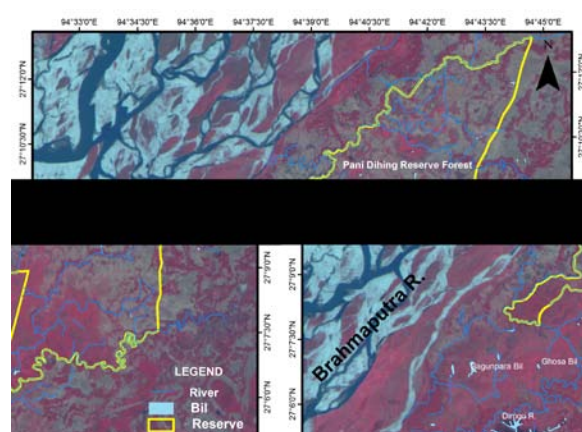


FIG. 5 IRS IMAGE OF 2010 (RGB – 3, 2, 1) SHOWING THE WETLANDS OF THE STUDY AREA.

Conclusion

Panidihing bird sanctuary is gifted with myriads of

wetlands. Although these wetlands are potentially very rich in various aquatic resources, these wetlands, however, constitute a fast disappearing habitat in the Panidihing area. They are presently facing serious threat to its survival mainly due to siltation by flood and various human activities. It is therefore an imperative need to conserve the wetlands especially to enrich the geo-environmental quality of the region, and appropriate conservational measures should be taken. It becomes necessary to properly conserve the wetlands for the benefit of the present as well as future generations.

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